

Presentation Overview

PROPRIETARY

- **Concept**

- A new mass market consumer electronics product using satellite digital transmission

- **Technology**

- Proprietary firmware embodied code and unique system design, low cost, simple operation

- **Costs**

- 2 Phase Development Stage, total cost less than \$10 million

- **Markets**

- Niche near-term 2-3 yrs. followed by diverse mass market in 5-6 yrs.

- **Alternative Strategies**

- Workstation peripheral device or independent appliance; flexible or specialized

- **Revenue**

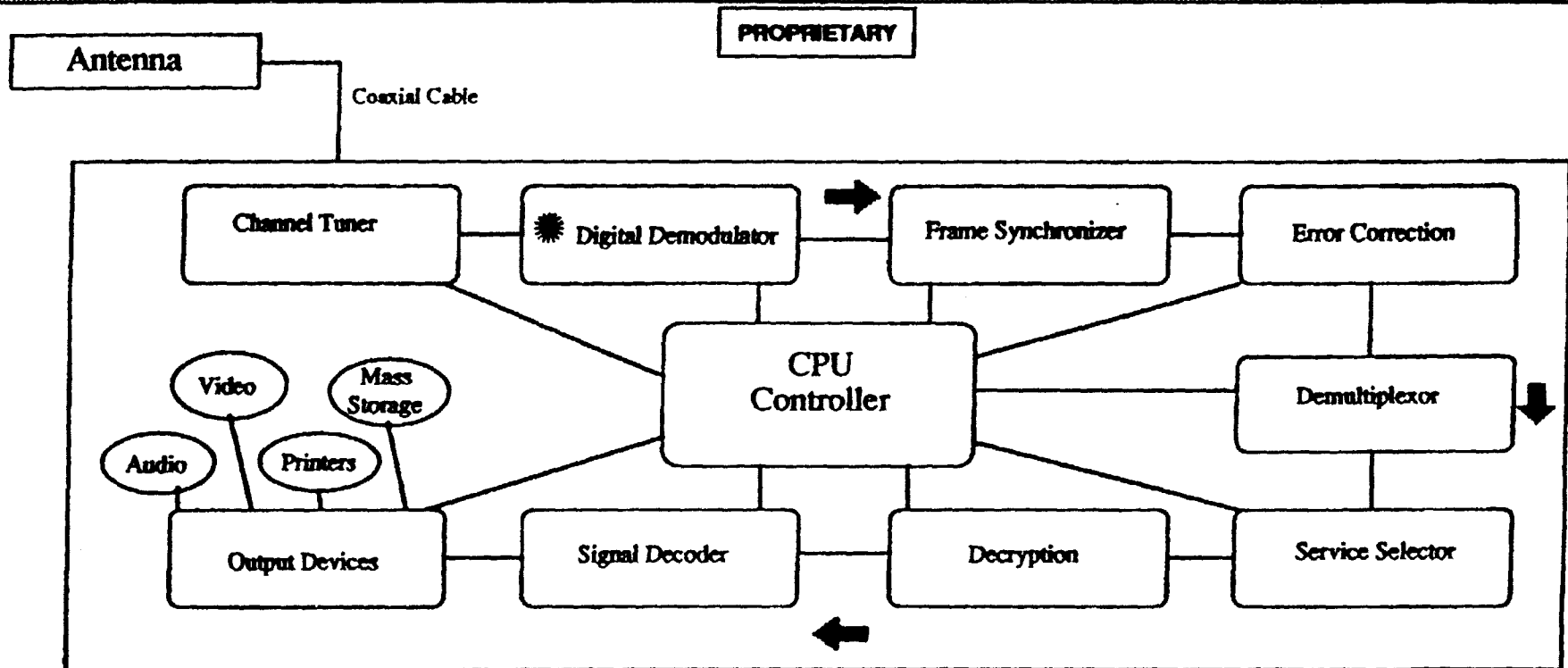
- Royalties generated by different manufacturers and distributors

- **Proposed Investment Structure**

- A R&DLP for a percentage of the royalty cash flow



Technology: Circuit Block Diagram



- Copyrighted compression algorithms
- Low cost, low power, compact design
- Integrated carrier tracking and bit synchronization
- IC performs demodulation
- No satellite backhaul in 1st generation system, but...

Cost

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- **Development cost related to duration and number of people**
- **Development has two stages**
 - **generic digital pipe**
 - **articulated, flexible multiservice video platform**
- **Demonstration in 12 months for both stages**
- **Prototype in 20-24 months for both stages**
- **Stage 1 would require between 6 and 10 people (3-5 key)**
- **Stage 2 would require between 20 and 30 people (5-7 key)**
- **Estimated total cost for both stages less than \$10 million**

Markets

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1991	1992	1993	1994	1995	1996
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Peripheral Device for
High End PCs

20,000 1st Year
Niche Market

Incorporated within
Appliances: Pagers,
High Fidelity Radio, etc.

100,000 1st year
Numerous niche applications

Digital DBS System
Education, TV Entertainment,
Music, Electronic Publishing,
Data, Telecommuting, HDTV,
Others

600,000 1st Year
Broad consumer market

growing to 1,000,000+ in
each subsequent year



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Alternative Strategies

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- **Technology development theme**

- Focus on non DBS related applications in the near-term (2-3 years, followed by DBS focus)
- Focus on DBS applications from the start
- Focus on both DBS and other applications simultaneously
- Target proprietary standard or universal compatibility

- **Distribution**

- Market licences to all interested parties, or
- Market licenses to just strategic partners for related deals

- **Investment**

- Seek individual investors
- Seek corporate investors, or both
- Target strategic partners in the television, publishing, entertainment, RF supplier, or microcomputer industries



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Royalty Revenue Profile

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- ACE revenue equals the product of the royalty and the number of sales in each product niche
- The royalty could be set between \$15 and \$30, or less than 10% of the cost
- The investor share of ACE royalty cash flow can follow a sliding scale, beginning high and diminishing as cumulative revenues reach pre-negotiated targets.
- Below is a sample revenue projection, with a cumulative revenue target break point of \$60M, and a royalty of \$23.75

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Sales (000)			20	100	800	1200	1500	1700	1800
Revenue			475	2375	19000	28500	35625	40375	42750
Cumulative			475	2850	21850	50350	85975	126350	169100
Investor Share			0.9	0.85	0.8	0.8	0.35	0.35	0.35
Annual Share	-10000		428	2019	15200	22800	12469	14131	14963
Cumulative \$			428	2446	17646	40446	52915	67046	82009
Cumulative % of Total			90%	86%	81%	80%	62%	53%	48%
IRR					22.3%	50.9%	57.4%	61.2%	63.4%
NPV			-8372	-7045	1646	12981	18372	37237	42862



Proposed Investment Structure

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- **Stage 1 Approximately \$3 million**

- Funds both phases to demonstration or phase one to proto-type
- Accelerated recovery
- Investors receive 40% of royalty CF in 1st year, 35% in 2nd, 30% in 3rd, and 30% for each additional year where the cumulative CF is less than \$20 million
- Thereafter, investors receive 10% of the royalty cash flow.

- **Stage 2 Approximately \$6.5 million**

- Funds technical expenses for both phases from demonstration to prototype
- Accelerated recovery
- Investors receive 50% of royalty CF in 1st year, 45% in 2nd, 40% in third, and 40% for each additional year where the cumulative CF is less than \$60 million
- Thereafter, investors receive 25% of the royalty CF

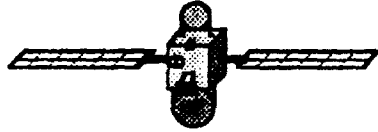
- **Combine both Stages from the start**



Board of Directors

PROPRIETARY

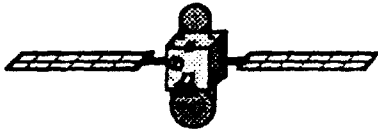
- Mr. James M. Beggs; former NASA Administrator, former Executive Vice President and Board Member, General Dynamics Company.
- Mr. Donald K. Dement; former director, NASA Communications Programs
- Dr. G. Gordon Apple; former TRW Senior Engineer and Bell Labs Engineer, Manager of Digital HDTV project for CBS (82'-83')
- Mr. Daniel Garner; entertainment and broadcast executive, real estate developer and financial services sales and trading executive
- Professional services are provided to ACE by Hogan & Hartson, Caroon and Black Inspace, and KPMG Peat Marwick, all of Washington, DC.



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Summary

- **A window of opportunity has opened to exploit digital RF broadcast of imagery and other data--the ISDB system**
- **This opportunity coincides with the coming digital revolution and the evolution of advanced IC devices in computers and television sets**
- **ACE management has identified an investment in the above opportunities projected to yield IRRs in excess of 45%, even under heavily discounted assumptions, with a five to six year horizon**
- **A 20-month development period funded with \$8-9 million will capture a 15% to 25% market share for the new receiver designs, the "ISDB integrated receiver decoder"**



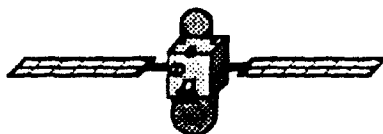
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Organizational Phase Budget

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Carry Over		\$1.3	\$1.5	\$1.8	\$3.0	\$1.3
Cash in	\$58.3	\$58.3	\$58.3	\$58.3	\$58.3	\$58.3
Salary	\$19.6	\$19.6	\$19.6	\$19.6	\$19.6	\$19.6
Payroll Tax	\$1.5	\$1.5	\$1.5	\$1.5	\$1.5	\$1.5
PT-New Hire	\$5	\$5	\$6	\$8	\$12	\$12
Patent Attorney	\$4	\$6	\$9	\$6	\$4	\$2
Other fees	\$5	\$5	\$5	\$5	\$5	\$5
Capital Equipment	\$15	\$12	\$6	\$6	\$6	\$6
Travel	\$3	\$5	\$7	\$7	\$8	\$8
Miscellaneous	\$4	\$4	\$4	\$4	\$4	\$4
Total	\$57.08	\$58.08	\$58.08	\$57.08	\$60.08	\$58.08

In Thousands of Dollars

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Month Two Expenses

Month Two \$50K/	Initial Salary	4680	3	\$14,000
	Placement Agents			\$5,000
	Patent Lawyers			\$3,000
	DiFonzo & Willard			\$4,000
	Other			\$1,500
	Capital Equipment			
	Furniture	400	2	\$800
	CPU	3500	1	\$3,500
	Scanners	900	2	\$1,800
	R&D Hardware			\$3,500
Travel	Other Software			\$1,200
	Leases	400	2	\$800
	LA-Wash	900	4	\$3,600
	Wash- Huntsville	500	2	\$1,000
	Wash -NY	150	2	\$300
	Contingency			\$4,400
			Total	\$48,400

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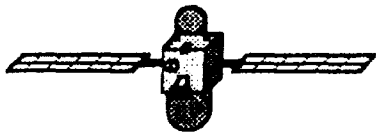


Month One Expenses

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Month One \$50K/	Initial Salary	4680	3	\$14,000
	Placement Agents			\$5,000
	Patent Lawyers			\$3,000
	DiFonzo & Willard			\$4,000
	Other			\$1,500
	Capital Equipment			
	Modems	500	3	\$1,500
	CPU	3500	1	\$3,500
	Printer	1500	1	\$1,500
	Other Hardware			\$3,500
Travel	Other Software			\$1,200
	Leases	400	2	\$800
	LA-Wash	800	3	\$2,400
	Wash. -Chicago	400	2	\$800
	Wash -NY	150	3	\$450
	Contingency			\$4,315
	Total			\$47,465

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Proposed Investment Structure

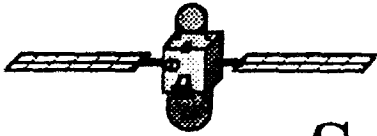
- **Seed investment of \$350,000 - for approximately 15% interim dilution (\$20,000/share for 17.5 common shares)**
 - option on senior investment if desired, callable with fee
 - board representation, and/or other consideration, including notes
- **Senior investment of roughly \$8 to \$9 million - for possible controlling interest in final dilution**
 - board representation proportional to investment
 - possible geographical rights to technology licenses, or other market consideration



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Development Cost

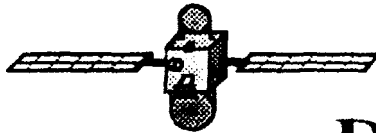
- **Development has two phases:**
 1. **demonstrate the demodulator and basic O/S**
 2. **demonstrate an articulated, multifunction receiver**
- **Demonstration in 12 months for phase 1**
- **Prototype in 18 to 22 months for phase two**
- **Phase 1 requires between 15 and 18 people (3-5 key)**
- **Phase 2 requires between 23 and 30 people (6-8 key)**
- **Estimated total cost for both stages: \$8-9 million**



Sources of Senior Financing

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- **Strategic Investors**
 - **Broadcasters need the technology:**
 - **Tribune, NBC, CBS, Cablevision, MCA, Hearst, others**
 - **Manufacturers want the market; some do not have the technology**
 - **Digital Communications specialists or marketing specialists**
- **Professional Investors**
 - **VCs in partnership**
 - **Key individual investors**
 - **Private Placement: Alex Brown, Wheat 1st, Walnut, etc.**
- **A Combination of Investment Sources**
 - **Contingent commitments, if ACE gets x\$ by date Y, then entity Z invests x/2**
 - **Seed investor has option**



Draft Income Statement

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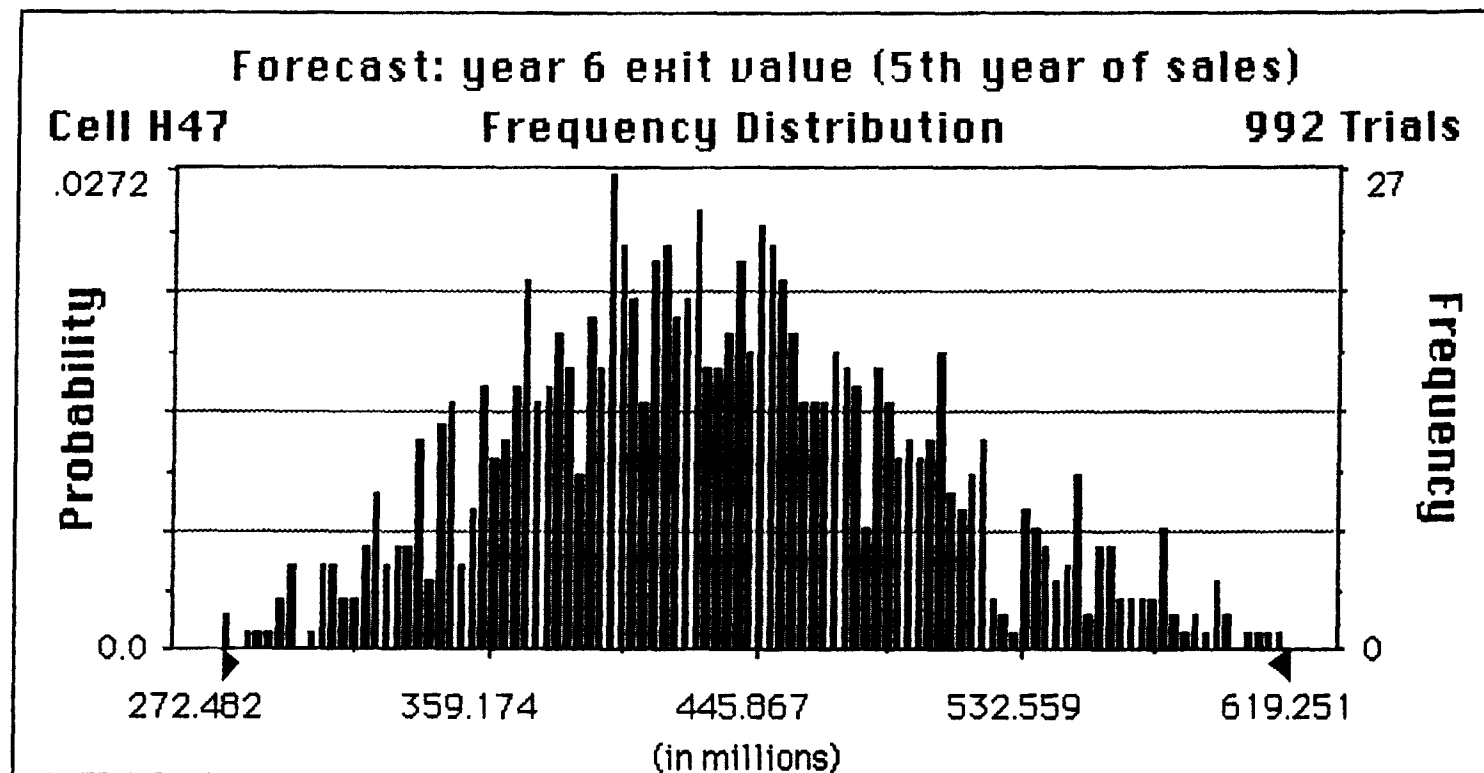
	325		150150	515970	1E+06	2E+06	3E+06
Cumul Volume			440	1440	2840	4540	6240
Sales Volume		15	425	1000	1400	1700	1700
Average Manufacturing Cost		\$900	\$710	\$540	\$430	\$390	\$360
Royalty Streams: & royalty rates	93	94	95	96	97	98	99
Receivers		0.405	\$9.1	\$16.2	\$18.1	\$19.9	\$18.4
0.03							
Local O/S			\$0.9	\$3.1	\$6.4	\$10.8	\$15.5
0.006							
Transmission O/S		\$0.04	\$1.1	\$3.6	\$7.5	\$12.6	\$18.1
0.007							
Conditional Access		0.108	\$2.4	\$4.3	\$4.8	\$5.3	\$4.9
0.008							
Digital Demodulator		0.108	\$2.4	\$4.3	\$4.8	\$5.3	\$4.9
0.008							
Local Primitives		\$0.1	\$1.8	\$3.2	\$3.6	\$4.0	\$3.7
Total		\$0.7	\$17.6	\$34.8	\$45.2	\$57.8	\$65.5
Expenses:	93	94	95	96	97	98	99
Salary & Benefits	2.4	2.8	3.2	3.36	3.53	3.70	3.89
Rent & Utilities	0.175	0.25	0.3	0.32	0.33	0.35	0.36
Annual Capital Equipment	0.35	0.25	0.35	0.37	0.39	0.41	0.43
Marketing Promotion & Sales	0.275	0.3	0.5	0.53	0.55	0.58	0.61
Professional Fees	0.2	0.2	0.35	0.37	0.39	0.41	0.43
Travel and Other	0.2	0.2	0.25	0.26	0.28	0.29	0.30
Total	3.60	4.00	4.95	5.20	5.46	5.73	6.02
EBITD		(\$3.26)	\$12.7	\$29.6	\$39.7	\$52.1	\$59.5
34%							
After Tax Operational CF	(\$3.60)	(\$3.26)	\$8.4	\$19.5	\$26.2	\$34.4	\$39.2
11							
Market Exit Value		(\$35.85)	\$92.2	\$214.8	\$288.5	\$378.0	\$431.6

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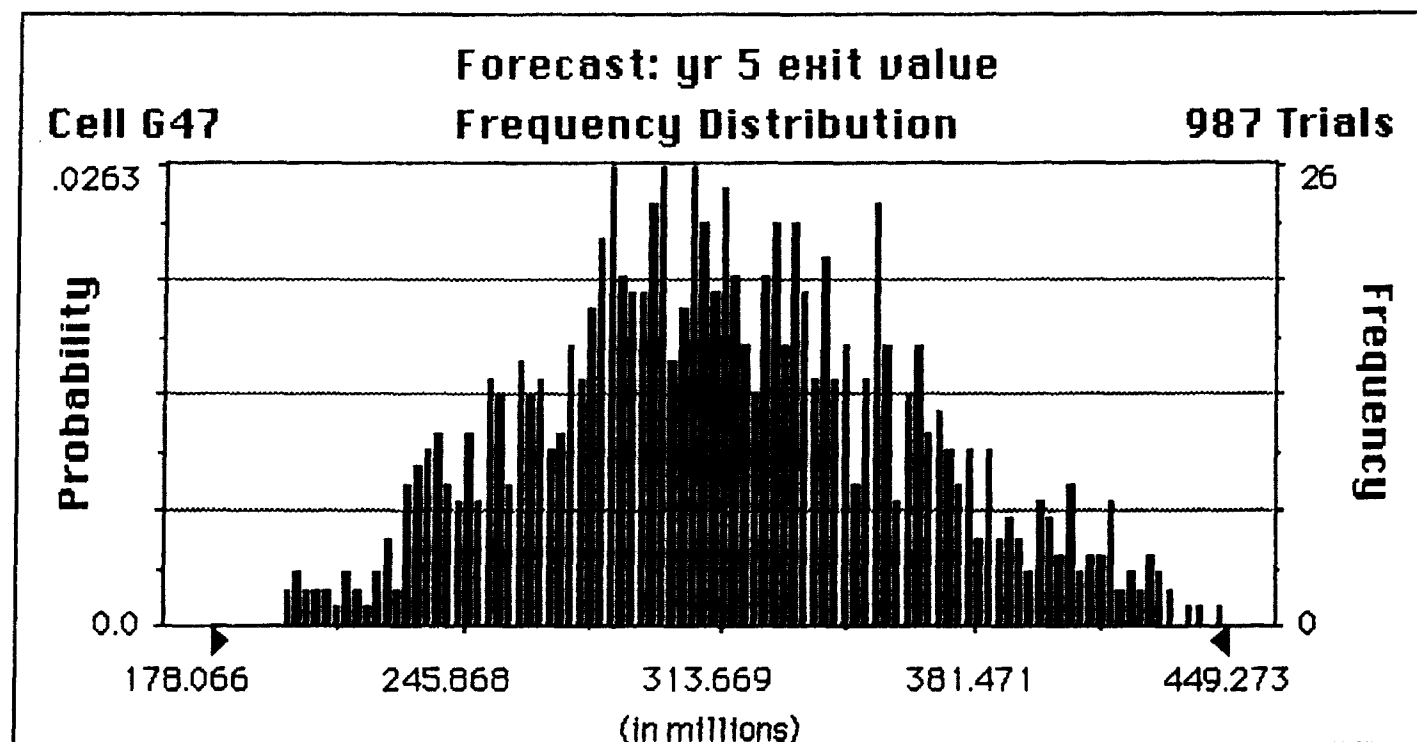
Monte Carlo Projection 6 Year Exit Value

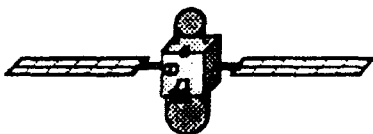




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Monte Carlo Projection 5 Year Exit Value





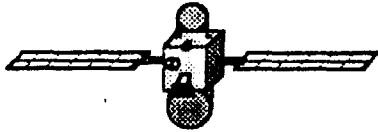
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Royalty Revenue & Expense Profile

- ACE revenue equals the product of the royalty and the number of sales in each product category
- The royalty should be set at less than 10% of the total receiver cost
- The investor share of ACE royalty cash flow can follow a sliding scale, beginning high and diminishing as cumulative revenues reach pre-negotiated targets.
- Estimated IRR is based on projected exit value, not cash flow

	325	150150	515970	1E+06		93	94	95	96	97	
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Total	\$0.7	\$17.6	\$34.8	\$45.2							

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Financial Assumptions

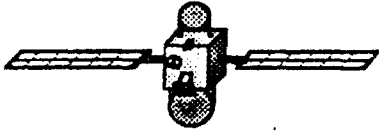
- **At least Five potential royalty-earning components related to revenues from receiver, chip manufacturers and broadcasters**
- **ACE employs less than 30 during the 20-month development period**
- **Revenue begins before the end of the 2nd year, positive cash flow and breakeven in year 3**
- **Only US-based revenue is considered in initial projections, although considerable foreign revenue is probable via joint ventures**



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Barriers to Further Competitive Entry

- **Patents on overall system and both specific software and hardware elements (5-9) of the system**
- **Interactive operating system between broadcaster's transmission equipment and customer's Receiver**
- **Specific algorithms on firmware; difficult to pirate**
- **Graphic user interface (GUI) conventions have protectable "look and feel"**
- **Chip controlling open architecture can be widely sold to other manufacturers to discourage competing open architectures**



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Competition (cont.)

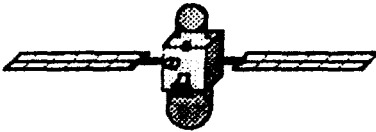
- **General Instrument and Scientific Atlanta video receiver divisions, conflict of Interest.**
- **Cable TV and DBS compete in the 1994 to 2005 time frame. Cable may not develop in foreign markets. Both go digital.**
- **Strong advantage for a US-based, dedicated receiver design and manufacturing capability**
- **Strong advantage w/ consumers if price / performance ratio is attractive**
- **Foreign competition based on manufacturing advantage and distribution channels**



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Competition

- No known direct Comprehensive Competitive design
- Known DBS Receivers have Closed-box Architectures
 - Hughes-Hubbard, architecture unknown, Thomson supplier
 - Scientific-Atlanta, CLI, &/or GI, possible contributors
- High-end Computers w/ Video Capability could compete
 - IBM, Apple, Commodore, Tandy, Atari
 - High cost, secondary TV orientation



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Potential Business Relationships

- **Broadcasters**
 - Hughes
 - Fujisankei, Phillips, Thomson
 - Echosphere, MCA, Tribune, CBS, Hubbard, Tempo, Contel, GE, Hughes, British Aerospace, RBOCs, the networks, many others
- **Manufacturers**
 - TV sets, computer, other consumer electronics, chips, and broadcast equipment suppliers
 - Thomson, Phillips, SCI, Matsushita, Sony, Zenith, Scientific Atlanta, GI, Daewoo, Gold Star, TI, Motorola, LSI, many others
- **Software and other publishers**
 - Record clubs, serial publications, database compilers
 - Adobe, Aldus, Microsoft, Lotus, Claris, Silicon Beach, many others
- **Educational, instruction, advertising, and training organizations**



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Initial Product Strategy

- Possible product for late 1993 entry. A high-end add-in card for education workstations linked to Ku-band transponders.
- A university and corporate niche market that is active today.
- Card offers inexpensive capacity with digital transmission.
- The technical customer is frequently an innovation leader.
- The lower production volume add-in card inexpensively debugs manufacturing process for the later, full-up receiver.
- The Cable/DBS product must be ready for manufacturing by early to mid 1994.